I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO: ASSISTANT COMMISSIONER FOR PATENTS, WASHINGTON, D.C. 20231, ON THE DATE INDICATED BELOW.

BY: Rose A. Stowe DATE: April 21, 2003

Rose A. Stowe

#18 5/5/03 jc

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re:	Patent Application of Horst Sulzbach, *et al.*	: Group Art Unit: 1712
Appln. No.:	09/743,125	: Examiner: Robert E. Sellers
Filed:	April 23, 2001	:
For:	SELF-DISPERSING, HARDENABLE EPOXY RESINS, PROCESSES FOR PRODUCING THE SAME AND METHODS OF USING THE SAME	: Attorney Docket No.: **H 3467 PCT/US**

APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. §1.192

Pursuant to the Notice of Appeal filed on December 19, 2002, via facsimile, and received by the U.S. Patent & Trademark Office on the same date, Appellants submit herewith a Brief On Appeal under 37 C.F.R. §1.192, appealing the Examiner's final rejection of pending claims 8-20, as set forth in the final Office Action dated June 19, 2002 (Paper No. 11), as maintained in the Advisory Action dated November 26, 2002 (Paper No. 14). This Brief On Appeal is being timely filed as a Petition for a two-month extension of time, up to and including April 21, 2003 (April 19, 2003 being a Saturday), including an authorization to charge fees, is being submitted herewith.

Appellants respectfully request consideration by the honorable Board of Patent Appeals and Interferences and reversal of the Examiner's rejection of all pending claims based on the arguments set forth in the attached brief.

TABLE OF CONTENTS

REAL PARTY IN INTEREST

The real party in interest in the instant appeal is Cognis Deutschland GmbH & Co. KG, a German company having a place of business at Henkelstraße 67, 40589 Düsseldorf, Germany.

RELATED APPEALS AND INTERFERENCES

Appellants are not aware of any related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the instant appeal.

STATUS OF THE CLAIMS

Claims 8-20 are pending in the instant application on appeal. All of the pending claims are the subject of the instant appeal.

Claims 8-20 stand finally rejected under 35 U.S.C. §103(a), as being unpatentable over U.S. Patent No. 5,641,855 of Scherr, *et al.*, (hereinafter referred to as "Scherr"), for the reasons of record set forth in Paper No. 11, Paper No. 14 and the Office Action dated December 14, 2001 (Paper No. 8).

STATUS OF AMENDMENTS

No amendments have been filed in the instant application on appeal subsequent to the Examiner's final rejection of claims 8-20. Appellants' Request for Reconsideration After Final, filed on November 19, 2002 ("the Request for Reconsideration After Final"), has been considered but was not deemed to place the instant application in a condition for allowance, as indicated in Paper No. 14. An appendix containing a copy of the claims involved in the appeal, in accordance with 37 C.F.R. §1.192(c)(9), is attached as Appendix A.

SUMMARY OF THE INVENTION

Appellants have surprisingly discovered that epoxy resins prepared by processes in accordance with the claimed invention are self-dispersible, highly stable in storage, and produce coatings upon curing which exhibit excellent properties. (*See,* Appellants' Specification, p. 4, lines 1-5; & p. 3, lines 16-30). As explained in Appellants' Specification, "self-dispersible" means that the epoxy resins can be dispersed or emulsified spontaneously in aqueous medium without the use of additional additives, such as emulsifying or dispersing additives. (*See, id.* at p. 3, lines 17-20). Accordingly, Appellants' claimed invention is directed to processes for producing self-dispersing, curable, epoxy resins. Appellants' invention is a significant and unexpected improvement over the prior art. As noted by Appellants, coatings produced using aqueous epoxy resin dispersions have long been considered inferior to those coatings prepared using an epoxy resin in an organic solvent solution, as usual emulsifiers migrate to the coating surface adversely affecting the coating properties. (*See,* Appellants' Specification, p. 1, lines 10-16).

One embodiment of Appellants' claimed invention is directed to a process for producing self-dispersing, curable, epoxy resins; the process comprising two reactions. The first reaction involves forming an intermediate product Z1 by reacting (a) one or more α,β-unsaturated carboxylic acid esters with (b) one or more aminopolyalkylene oxide compounds having at least one aminonitrogen atom with one or more reactive hydrogen atoms, wherein (a) and (b) are present in quantities such that the equivalent ratio of the reactive hydrogen atoms in (b) to the α,β C=C double bonds in (a) is from 10:1 to 1:10. The intermediate product Z1 is reacted with (c) one or more polyepoxides. (*See,* Claims 8-20, set forth in Appendix A). In one preferred embodiment of the claimed invention, (a) and (b) are present in quantities such that the equivalent ratio of the reactive hydrogen atoms in (b) to the α,β C=C double bonds in (a) is from 4:1 to 1:4. (*See,* Claim 14, set forth in Appendix A).

The epoxy resins produced by the claimed process are self-dispersing and coatings produced using the epoxy resins do not suffer from the aforementioned drawbacks, such as migration.

ISSUES

(1) Is the Scherr reference, which fails to teach or suggest a process for producing self-dispersing, curable, epoxy resins according to claim 8, wherein component (a) and component (b) are present in quantities such that the equivalent ratio of the reactive hydrogen atoms in (b) to the α,β C=C double bonds in (a) is from 10:1 to 1:10, insufficient to establish a *prima facie* case of obviousness with respect to claims 8-20?

(2) Is the Scherr reference, which fails to teach or suggest a process for producing self-dispersing, curable, epoxy resins according to claim 14, wherein component (a) and component (b) are present in quantities such that the equivalent ratio of the reactive hydrogen atoms in (b) to the α,β C=C double bonds in (a) is from 4:1 to 1:4, insufficient to establish a *prima facie* case of obviousness with respect to claim 14?

GROUPING OF THE CLAIMS

For the purposes of the instant appeal, all of the pending claims do not stand or fall together. For the purposes of contesting the Examiner's rejection of claims 8-20 under 35 U.S.C. §103(a), Appellants submit that two distinct groups of claims are present and should be addressed separately. Specifically, Appellants submit that claims 8-13 and 15-20 stand or fall separately from claim 14.

The rationale for this distinction is set forth in greater detail below in the Argument section of this Brief on Appeal, in accordance with 37 C.F.R. §1.192(c)(7).

ARGUMENT

I. *The Examiner's Rejection Under 35 U.S.C. §103(a) is Improper*

A. *The Rejection of Claims 8-20 Over Scherr*

In Paper No. 11, the Examiner maintains the rejection of claims 8-20 under 35 U.S.C. §103(a), as being unpatentable over Scherr, for the reasons of record set forth in Paper No. 8.

The Examiner continues to contend that Scherr discloses "the reaction of polyetheramine or polyoxyalkylenepolyamine (a) with unsaturated carboxylic acid ester (b) 'in such a ratio that from 20-99%, preferably from 30-85%, of the primary amino groups of (a) survive unchanged into the reaction product of (a) and (b).'" (*See,* Paper No. 11, p. 2 *citing* col. 6, lines 6-9 of Scherr). The Examiner argues that "[t]he unreacted amino group content of from 20-99% embraces the claimed active hydrogen:C=C equivalent ratio of as high as 10:1." (*See, id.*). On this basis the Examiner maintains that the claimed invention is obvious.

In Paper No. 14, the Examiner again maintains the rejection but finally notes, in response to Appellants' arguments presented in the Request for Reconsideration After Final, that in contrast to the Examiner's previous assertion, Scherr actually teaches that the (meth)acrylate is reacted with the polyetheramine or polyoxyalkylenepolyamine "to the extent that from 20-99% of the primary *and secondary* amino groups remain unreacted . . .." (*See,* Paper No. 14, p. 2 (*emphasis added*)).

The Examiner insists that the teachings of Scherr embrace Appellants' claimed invention.

B. *Appellants' Traversal*

Appellants respectfully traversed the Examiner's rejection in the Request for Reconsideration After Final, and initially in Appellants' Request for Reconsideration, filed on June 12, 2002, in response to Paper No. 8

Appellants again strenuously, but respectfully, traverse the Examiner's rejection and the contentions and arguments in support thereof, for the reasons set forth below.

C. *Requirements for Establishing Prima Facie Obviousness*

It is well-settled that in order for an Examiner to establish a case of *prima facie* obviousness based upon a single reference, and thus shift the burden of proving non-obviousness onto Appellants, each of the following three criteria MUST be established: (1) the reference must contain a teaching or suggestion which would motivate one of ordinary skill in the art to

modify the reference as suggested by the Examiner (it is not sufficient to say that the reference can be modified without a teaching in the cited reference to suggest the desirability of such a modification); (2) there must be a reasonable expectation of success; and (3) the reference must teach or suggest each and every element of Appellants' claimed invention. (*See,* M.P.E.P. §2143).

D. *Lack of Prima Facie Obviousness with respect to Claims 8-20:*

Scherr discloses products obtained by reacting components (a), (b) and (c). Component (a) is an amino-containing compound selected from polyalkylenepolyamines, polyamidoamines, ethylene-imine-grafted polyamidoamines, polyetheramines and mixtures thereof. Component (b) is selected from the group consisting of monethylenically unsaturated carboxylic acids, salts, esters, amides or nitriles of monoethylenically unsaturated carboxylic acids, chlorocarboxylic acids and/or glycidyl compounds such as glycidic acid, glycidamide or glycidyl esters. Component (c) is an "at least bifunctional crosslinker".

In the portion of the Scherr reference cited and initially misquoted (see italicized portion below) by the Examiner, it is suggested that to obtain ready-to-use water-soluble condensation products, that components (a) and (b) are to be used in such a ratio that from 20 to 99% of the *primary and secondary amino groups* of (a) survive unchanged. Scherr does NOT disclose reacting (a) one or more α,β-unsaturated carboxylic acid esters with (b) one or more aminopolyalkylene oxide compounds having at least one aminonitrogen atom with one or more reactive hydrogen atoms, wherein (a) and (b) are present in quantities such that the equivalent ratio of the reactive hydrogen atoms in (b) to the α,β C=C double bonds in (a) is from 10:1 to 1:10.

To begin with, the portion of the Scherr reference cited by the Examiner makes no mention of C=C double bond equivalents. Component (b), as disclosed in Scherr, may include a variety of compounds with various, multiple reactive groups other than a carbon-carbon double bond, such as chlorocarboxylic acids and/or glycidyl compounds such as glycidic acid, glycidamide or glycidyl esters. There is no indication in Scherr that any particular ratio of reactive hydrogen atoms to α,β C=C double bonds should be used.

Even if it were assumed for argument's sake, that the cited statement in Scherr could be interpreted as referring to a ratio of reactive hydrogen equivalents to C=C double bond equivalents, it cannot be said that the citation discloses the claimed equivalent ratio with respect to reactive hydrogen atoms. A primary amino moiety contains two reactive hydrogens. A secondary amino moiety contains one reactive hydrogen. To state that from 20 to 99% of the primary and secondary amino groups of (a) survive unchanged, as Scherr does, has no definitive meaning with respect to the number of active hydrogen atoms left unreacted, absent some disclosure as to the number of primary amino groups and the number of secondary amino groups per mole and which of the two remain "unchanged".

It is thus submitted that Scherr fails to teach or suggest the claimed equivalent ratio of reactive hydrogen atoms in claimed component (b) to α,β C=C double bonds in claimed component (a). Moreover, there is no teaching or suggestion in Scherr which would motivate one of ordinary skill in the art to modify the teachings of Scherr, as suggested by the Examiner, in order to arrive at Applicants' claimed invention. Scherr does not make any reference to the claimed ratio. Absent such direction, one of ordinary skill in the art would have no reason to extrapolate such a ratio from the vague, indefinite recitation cited by the Examiner. IT IS EXTREMELY WELL-SETTLED THAT THE FACT THAT A REFERENCE CAN BE MODIFIED IS INSUFFICIENT WITHOUT A TEACHING OR SUGGESTION IN THE PRIOR ART AS TO THE DESIRABILITY OF THE MODIFICATION. (*See,* M.P.E.P. §2143). Finally, one of ordinary skill in the art would have no reasonable expectation of success in making such an unmotivated modification.

Accordingly, Appellants submit that the Examiner has failed to establish a *prima facie* case of obviousness, as none of the three criteria necessary to establish a *prima facie* case of obviousness has been satisfied. Thus, Appellants respectfully request reversal of the Examiner by the Honorable Board and withdrawal of the rejection under 35 U.S.C. §103(a).

E. *Lack of Prima Facie Obviousness with respect to Claim 14:*

Appellants respectfully submit that Scherr is also insufficient to establish a *prima facie* case of obviousness with respect to claim 14, separate and apart from the insufficiency of the reference with respect to claims 8-13 and 15-20.

The Examiner has made no previous distinction with respect to claim 14. The Examiner has only argued that the teachings of Scherr "embrace" the claimed active hydrogen:C=C equivalent ratio of as high as 10:1. The Examiner has not addressed the equivalent ratio set forth in claim 14. Appellants respectfully submit that Scherr fails to teach or suggest the claimed equivalent ratio set forth in claim 14. Based on the reasons set forth above with respect to all pending claims, including the lack of any specific reference to α,β C=C double bonds and the lack of any teaching as to the individual numbers of primary and secondary amino groups left unreacted, Appellants submit that Scherr fails to teach the claimed equivalent ratio and contains no teaching which would motivate one of ordinary skill in the art to modify the reference in order to arrive at the claimed equivalent ratio. Appellants further submit that Scherr is even less likely to motivate one of ordinary skill in the art towards the narrower equivalent ratio range of claim 14, than the broader ratios set forth in claims 8-13 and 15-20.

Accordingly, Appellants submit that the Examiner has failed to establish a *prima facie* case of obviousness with respect to claim 14, as none of the three criteria necessary to establish a *prima facie* case of obviousness has been satisfied. Thus, Appellants respectfully request reversal of the Examiner by the Honorable Board and withdrawal of the rejection under 35 U.S.C. §103(a), at least with respect to claim 14.

CONCLUSION

In view of the arguments set forth above, Appellants submit that the Examiner's rejection under 35 U.S.C. §103(a) is improper in that the Examiner has failed to establish a *prima facie* case of obviousness, and that all claims on appeal patentably distinguish over the prior art of record and known to Appellants, either alone or in combination. Accordingly, Appellants respectfully request that the Board find for Appellants and reverse the Examiner's final rejection.

Respectfully submitted,

HORST SULZBACH, *et al.*

April 24, 2003
(Date)

By: _____

AARON R. ETTELMAN
Registration No. 42,516
COGNIS CORPORATION
2500 Renaissance Blvd., Suite 200
Gulph Mills, PA 19046
Telephone: (610) 278-4930
Facsimile: (215) 278-4971
E-Mail: AARON.ETTELMAN@COGNIS-US.COM

ARE:are

APPENDIX A

Claims On Appeal:

1. CANCELED
2. CANCELED
3. CANCELED
4. CANCELED
5. CANCELED
6. CANCELED
7. CANCELED

8. A process for producing self-dispersing, curable, epoxy resins, the process comprising:

(i) reacting (a) one or more α,β-unsaturated carboxylic acid esters of the general formula (I),

$$R^2R^3C=C(R^4)COOR^1 \qquad (I),$$

with (b) one or more aminopolyalkylene oxide compounds having at least one aminonitrogen atom with one or more reactive hydrogen atoms, wherein R^1 represents a hydrocarbon radical having up to 15 carbon atoms, wherein R^2, R^3, and R^4 each independently represents a substituent selected from the group consisting of hydrogen, hydrocarbon radicals having up to 20 carbon atoms, and $-(CH_2)_n-COOR^1$, wherein R^1 is as defined above and n represents a number of from 0 to 10, and wherein (a) and (b) are present in quantities such that the equivalent ratio of the reactive hydrogen atoms in (b) to the α,β C=C double bonds in (a) is from 10:1 to 1:10, to form an intermediate product Z1; and

(ii) reacting the intermediate product Z1 with (c) one or more polyepoxides having a number of oxirane rings, wherein the intermediate product Z1 and the one or more polyepoxides are present in quantities such that the equivalent ratio of the the oxirane rings to the reactive hydrogen atoms in (b) is from 100:1 to 1.5:1.

9. The process according to claim 8, wherein the (a) one or more α,β-unsaturated carboxylic acid esters of the general formula (I) comprises a dialkyl maleate.

10. The process according to claim 9, wherein the dialkyl maleate is selected from the group consisting of dimethyl maleate, diethyl maleate and mixtures thereof.

11. The process according to claim 8, wherein the (b) one or more aminopolyalkylene oxide compounds comprises a monoaminopolyalkylene oxide compound.

12. The process according to claim 11, wherein the monoaminopolyalkylene oxide compound corresponds to the general formula (II):

$$R^8\text{-}O\text{-}R^9\text{-}CH_2CH(R^{10})\text{-}NH_2 \qquad (II)$$

wherein R^8 represents a monofunctional organic group having from 1 to 12 carbon atoms, R^9 represents a polyoxyalkylene group having from 5 to 200 polyoxyalkylene units selected from the group consisting of ethylene oxide, propylene oxide and statistical or block mixtures thereof, and R^{10} represents hydrogen or an aliphatic radical having from 1 to 4 carbon atoms.

13. The process according to claim 11, wherein the mono-aminopolyalkylene oxide compound has an average molecular weight of from 148 to 5000.

14. The process according to claim 8, wherein (a) and (b) are present in quantities such that the equivalent ratio of the reactive hydrogen atoms in (b) to the α,β C=C double bonds in (a) is from 4:1 to 1:4.

15. The process according to claim 8, wherein the intermediate product Z1 and the one or more polyepoxides are present in quantities such that the equivalent ratio of the the oxirane rings to the reactive hydrogen atoms in (b) is from 4:1 to 2:1.

16. A self-dispersing, hardenable epoxy resin, said epoxy resin produced by the process according to claim 8.

17. A self-dispersing, hardenable epoxy resin, said epoxy resin produced by the process according to claim 9.

18. A self-dispersing, hardenable epoxy resin, said epoxy resin produced by the process according to claim 11.

19. An aqueous dispersion comprising a self-dispersing, hardenable epoxy resin according to claim 16.

20. The aqueous dispersion according to claim 19, wherein the self-dispersing, hardenable epoxy resin comprises dispersed particles having a mean particle size of 500 nm or less.